

R E M A R K S

In the Office Action dated October 2, 2007, claims 14, 15, 23, 24 and 26 were rejected under 35 U.S.C. §102(b) as anticipated by, or in the alternative, under 35 U.S.C. §103(a) as obvious over Goldreyer. Claims 16-22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Goldreyer.

These rejections are respectfully traversed for the following reasons.

In the subject matter disclosed and claimed in the present application, a multi-dot electrode unit is used to sense heart signals, with each dot electrode of the multi-dot electrode unit sensing an individual signal. These individual signals are supplied to a processor that combines the individual signals to produce a synthetic reference signal. The processor then determines a difference between each individual signal and the synthetic reference signal. Based on the respective differences determined in this manner, the processor forms an indication signal that is indicative of heart events.

The Goldreyer reference is concerned with a method and an apparatus for ablating cardiac tissue and, during the ablation procedure, electrical signals are detected from the cardiac tissue by multiple pairs of orthogonal electrodes. As shown in Figure 1 for one pair of electrodes 12, the respective signals from the electrodes in the pair are supplied to a differential amplifier 28, that forms a difference signal between the respective signals from the electrodes 12 in the pair, and this difference signal is supplied as an input to the stimulating (ablating) pulse generator 26, as well as to a monitor 30.

In the embodiment of Figure 2, making use of multiple pairs of electrodes, each electrode pair has its own differential amplifier associated therewith, that forms a difference signal between the respective signals from the electrodes in that pair. The outputs of the multiple differential amplifiers are supplied to a digital bus 52, and from the digital bus 52 are supplied to a computer 54 or to a conventional output device 56.

There is no mention whatsoever in the Goldreyer reference of the formation of any type of synthetic reference signal that is produced by combining the individual signals from a number of individual dot electrodes, as set forth in independent claim 14, and therefore there is also no mention or disclosure whatsoever in the Goldreyer reference to determine a difference between each individual signal and such a synthetic reference signal. Since there is no disclosure in the Goldreyer reference to form such a synthetic reference signal, there is no disclosure, nor could there by any disclosure, to determine a difference between each individual signal and such a synthetic reference signal. Since there is no disclosure of determining such a difference, there is similarly no disclosure in the Goldreyer reference, nor could there by any disclosure, to form an indication signal based on the respective differences, as also set forth in claim 14.

In substantiating the rejection of claim 14 based on Goldreyer, the Examiner stated the Examiner “considers Goldreyer’s disclosure of a differential signal processing method to satisfy Applicant’s [sic] claimed limitation of both the synthetic reference signal and the indication signal that is based on respective differences because differential signal processing involves taking the sum of operational amplifiers outputs and the difference of the outputs derived thereof.” To the extent

that Applicants are able to understand this statement, Applicants respectfully submit it does not accurately describe differential processing in general, and clearly does not describe what is taking place in the Goldreyer disclosure.

In differential signal processing, as disclosed in the Goldreyer reference, two input signals are supplied to a differential amplifier, and that amplifier forms the difference between the two input signals, this difference being represented as an output signal. The manner by which the processing of output signal from such a differential amplifier, or the respective output signals of multiple differential amplifiers, can proceed could be in hundreds if not thousands of different ways. Therefore, the Examiner's reference to "the difference of the outputs derived thereof" is not understood. In differential processing, the difference is formed between the *inputs* to the differential amplifier.

Moreover, in the Goldreyer reference, it is essential that each pair of orthogonal electrodes have its own differential amplifier and the only difference that is formed is between the two respective signals of the two orthogonal electrodes in that pair. There is not individual treatment of any one signal from any one electrode in Goldreyer, but instead the respective signals from the two electrodes in a pair are always processed in common, namely by forming the difference therebetween. Since the signals from the respective pairs of electrodes in Goldreyer are supplied directly to the respective differential amplifiers in which the respective differences are formed, there is not even an opportunity in the Goldreyer reference for any one signal from one electrode to be acted on individually, so as to be combined with other individual signals as set forth in claim 1 of the present application. The *only*

outputs that are available for processing or analysis in the Goldreyer reference are *already* the difference signals at the outputs of the respective differential amplifiers.

By contrast, in the subject matter of claim 14 of the present application, the *individual* signals from the respective dot electrodes are first combined to form a synthetic reference signal. As noted above, since the two signals from each electrode pair in the Goldreyer reference are immediately supplied to the respective differential amplifiers, there is no possibility to form such a signal in the Goldreyer reference, because the *pairs* of signals are always processed together, with the first processing step being the immediate formation of a signal representing the difference therebetween.

Moreover, claim 14 then requires that the processor determine a difference between each individual signal and the aforementioned synthetic reference signal. Again, the only difference that is formed in the Goldreyer reference is between the respective signals of two electrodes in a pair.

Because there is no disclosure in the Goldreyer reference to form a difference between each individual signal and a synthetic reference signal, there is not, and cannot be, any disclosure in the Goldreyer reference to form an indication signal based on such respective differences, as also set forth in claim 14.

Claim 14, and certain of the dependent claims, have been editorially amended, consistent with recently adopted guidelines within the Patent and Trademark Office, to use the now-preferred term “configured” instead of “adapted”, and to use language consistent with those guidelines concerning the claiming of functional features. From the above discussion, it should be clear that none of these changes has been made for the purpose of distinguishing claim 14, or any other

claim of the application, over the teachings of the Goldreyer reference. Applicants submit that all of claims 14-27 in their original form are patentable over the teachings of the Goldreyer reference.

For the above reasons, Applicants submit that the Goldreyer reference does not disclose all of the elements of claims 14, 15, 23, 24 and 26 as arranged and operating in those claims, and thus does not anticipate any of those claims under 35 U.S.C. §102(b). Moreover, since the Goldreyer reference does not disclose or suggest combining individual signals from respective dot electrodes to form a synthetic reference signal, does not disclose or suggest forming a difference between the individual signals from the respective dot electrodes and such a synthetic reference signal, and does not disclose or suggest forming an indication signal based on the respective differences, none of claims 14, 15, 23, 24 or 26 would have been obvious to a person of ordinary skill in the field of designing implantable cardiac-assist devices, under the provisions of 35 U.S.C. §103(a), based on the teachings of Goldreyer.

The same arguments are applicable to the rejection of claims 16-22 based on Goldreyer.

All claims of the application are therefore submitted to be in condition for allowance, and early reconsideration of the application is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required, or to credit any overpayment to account No. 501519.

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